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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,935

08/18/2006

Nicolas Lucas

Serie 6510

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AIR LIQUIDE

Intellectual Property

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HOUSTON, TX 77056

EXAMINER

CHEN, CHRISTINE

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/589,935	<b>Applicant(s)</b> LUCAS ET AL.	
	<b>Examiner</b> CHRISTINE CHEN	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/18/2006</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13-14, 17-18, 21, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 13, the phrases "optionally, one or more salts" "possibly covered with a slag" and "comprising, in particular" render the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention.

Regarding claims 13 and 18, the phrases "a setpoint C2" and "a value C2", respectively, render the claims indefinite because the definition of C2 is unclear. Likewise, the phrase "or vice versa" in claim 13 renders the claim indefinite.

3. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131

USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, claim 13 recites the broad recitation “over about 10% by volume of oxygen”, and the claim also recites “over about 21% by volume of oxygen” which is the narrower statement of the range/limitation.

In the present instance, claim 14 recites the broad recitation “over about 88 vol% of O<sub>2</sub>”, and the claim also recites “over about 95 vol% of O<sub>2</sub>” which is the narrower statement of the range/limitation.

In the present instance, claim 17 recites the broad recitation “between about 1 and about 5”, and the claim also recites “between about 1.5 and about 3” which is the narrower statement of the range/limitation.

In the present instance, claim 18 recites the broad recitation “between about 3 vol% and about 15 vol%”, and the claim also recites “between about 6 vol% and about 10 vol%” which is the narrower statement of the range/limitation.

4. Claim 21 recites the limitations "the setpoint C1" in li. 2 and “the ratio R” in li. 3. There is insufficient antecedent basis for these limitations in the claim.

Claim 13 recites the limitation “the carbon monoxide CO” in li. 5. There is insufficient antecedent basis for this limitation in the claim.

5. Claim 24 is indefinite; the claimed method does not include any step.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 13-24 are rejected under 35 U.S.C. 102(a) or (b) as being anticipated by

Allemand (WO 2004099453, cited using its English equivalent, US 2007/0034054).

Allemand discloses a method for treating aluminum material comprising feeding a salt containing aluminum material into a furnace (see para. [0001] and [00032]), melting said aluminum material by using a burner supplied with an oxidizer fluid such as pure industrial oxygen and a fuel selected from natural gas, hydrocarbons and light or heavy fuel oil (see para. [0015] to [0016]) to obtain a molten aluminum substantially covered with a slag comprising alumina and at least one salt, measuring the concentration of CO or H<sub>2</sub> in a flue gas exiting the furnace using a diode laser (see para. [0028] to [0029]), and destroying substantially all the organic compounds present in the material by pyrolysis and followed by a stabilization phase (see para. [0018] to [0019]). The method also comprises a final phase for decreasing the oxidation of the molten aluminum by controlling the conditions of the burner and the furnace), during which the flow rate of the oxidizer is substantially constant while the flow rate of fuel varies according to the CO or H<sub>2</sub> concentration in the furnace atmosphere or flue gas (see para. [0042] to [0045] and claims 13-33), wherein said CO or H<sub>2</sub> concentration is controlled to between about 1% and 8% by volume and a volumetric ratio of oxygen to fuel is maintained between about 1 and about 5 (see para. [0016] and [0017]). Additionally, the aluminum oxidation limitation phase ends with the reintroduction of a new charge of material into the furnace (see para. [0020]).

Claim 20 inherently occurs during the treatment process.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 13-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ducrocq (WO 03056044, cited using its english equivalent, US 2005/0103159) combined with US patent 6,245,122 issued to Meyers.

Ducrocq discloses a method for treating aluminum material comprising feeding the aluminum material into a furnace (2 of Fig. 1), melting said aluminum material by using a burner supplied with an oxidizer fluid such as oxygen and a fuel such as a natural gas to obtain a molten aluminum, and measuring the concentration of CO or H<sub>2</sub> in a flue gas exiting the furnace using a diode laser (see 10 of Fig. 1, and para. [0068] to [0070]), and in that the method comprises a final phase for decreasing the oxidation of the molten aluminum by controlling the conditions of the burner and the furnace (see para. [0085] to [0111]) wherein said controlling step includes controlling the ratio of the flow rate of the oxidizer or oxygen to the flow rate of the fuel in the burner according to the measured concentration of said CO or H<sub>2</sub> in the flue gas (see Summary of the Invention, para. [0128] to [0144], and claims 31-61), wherein said CO or H<sub>2</sub> concentration is regulated at a value of between about 3 vol% and about 10 vol% (Fig. 6b and 6a) and a volumetric ratio of oxygen to fuel is maintained at about 1 (see para. [144]). In other words, the aluminum treatment process disclosed by Ducrocq substantially comprises every limitation of

the instant claims except for the step of holding the flow rate of the oxidizer constant while varying the flow rate of the fuel flowing into the burner.

The US '122 issued to Meyers teaches a method for treating molten aluminum in a furnace heated by a burner which is fed with oxygen and a fuel, wherein the flow rate of the oxidizer is held constant while the flow rate of the fuel stream is proportionally varied in order to ensure that the fuel and oxygen are completely burned, and that the burner is operated under an optimized condition (see Abstract, Col. 7 line 30 to Col. 8 line 37, and the claims).

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process for treating aluminum disclosed by Ducrocq by holding the flow rate of the oxidizer stream constant while varying the flow rate of the fuel as taught by Meyers in order to ensure that oxygen and fuel are completely burned and to allow the burner to operate in an optimized condition.

With respect to the presence of salt and alumina in the method as recited in claim 13, it is well known in the art to charge a furnace with salt-based fluxes in order to reduce the wetting of the oxide skeletons by trapped aluminum (Ducrocq, see para. [14]). Furthermore, the presence of alumina and salt within the slag during melting is well known in the art (Ducrocq, see para. [11] and see Eckert, US 5616167 Col. 1 lines 19-27).

Claims 19-20 and 22 inherently occur during the treatment process.

With respect to a stabilization phase as recited in claim 21, Ducrocq discloses the stabilization of the CO concentration at a value of about 23% (see Fig. 3A).

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by Ducrocq. The reference teaches using a diode laser to measure the concentration of CO exiting a furnace (see 10 of Fig. 1, and para. [0068] to [0070]).

***Double Patenting***

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 13-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 13-33 of copending Application No.



10/555313. Although the conflicting claims are not identical, they are not patentably distinct from each other because the sets of claims are indistinguishable from each other, covering the same limitations.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

14. Claims 13-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 31-63 of copending Application No.

10/497454. Although the conflicting claims are not identical, they are not patentably distinct from each other because the pending claims of the copending application substantially comprise every limitation of the claims of this application, except for the step of keeping the flow rate of oxidizer constant. As discussed in para. 9 above, Meyers teaches a method in the same field of endeavor comprising a controlling mechanism in which the flow rate of the oxidizer is kept constant while the fuel flow rate is varied in order to minimize the amount of generated carbon monoxide. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method for treating molten aluminum covered by the claims of the copending application 10/497454 by keeping the flow rate of oxidizer constant.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE CHEN whose telephone number is

Art Unit: 1793

(571)270-3590. The examiner can normally be reached on Monday-Friday 8:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/  
Supervisory Patent Examiner, Art  
Unit 1793

CC